

In the Claims:

1. (original) A green ceramic coating composition comprising nano-sized particles dispersed within a solvent together with pre-formed particles.
2. (original) A coating composition according to claim 1, wherein the nano-sized particles are less than 200nm in size.
3. (original) A coating composition according to claim 2, wherein the nano-sized particles are less than 100 nm in size.
4. (original) A coating composition according to claim 3, wherein the nano-sized particles have a particle size distribution in the range from 10nm to 100nm.
5. (currently amended) A coating composition according to ~~any one of the preceding claims~~ claim 1, wherein the solvent is selected from water or a polar organic solvent.
6. (currently amended) A coating composition according to ~~any one of the preceding claims~~ claim 1, wherein the pre-formed particles have a crystalline nano-structure.
7. (currently amended) A coating composition according to ~~any one of the preceding claims~~ claim 1, wherein the pre-formed particles have a particle size ranging from 5 μ m to 300 μ m.
8. (original) A coating composition according to claim 7, wherein the pre-formed particles have a particle size ranging from 10 μ m to 150 μ m.
9. (currently amended) A coating composition according to ~~any one of the preceding claims~~ claim 1, wherein the pre-formed particles form a framework such that at least some of the pre-formed particles contact each other.

10. (currently amended) A coating composition according to ~~any one of the preceding claims~~ claim 1, wherein the pre-formed particles are prepared from a ceramic material selected from any of the following either alone or in combination oxides, borides, silicides, phosphates, sulfides of any of the following boron, aluminium, silicon, titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum, tungsten, lanthanum, yttrium, iron, cobalt and nickel.
11. (original) A method for producing a ceramic coating upon a substrate, comprising the following steps:
preparing a nano-suspension comprising nano-sized ceramic particles,
preparing pre-formed particles,
concentrating the nano-suspension to form a nano-slurry,
mixing the preformed particles with the nano-slurry,
applying the aforesaid mixture to the substrate, and
heat treating the system such that the aforesaid particles produce a ceramic coating.
12. (original) A method according to claim 11, wherein the ratio of pre-formed particles to nano-sized particles is in a range from 1:5 to 1:1 on a dry weight basis.
13. (original) A method according to claim 12, wherein the ratio of pre-formed particles to nano-sized particles is 2:5.
14. (currently amended) A method according to ~~any of claims 11 to 13~~ claim 11, wherein the nano-slurry has a solid loading of from 20 to 60 wt%.
15. (currently amended) A method according to ~~any of claims 11 to 14~~ claim 11 wherein the nano-slurry is in the form of a paste.

16. (currently amended) A method according to ~~any of claims 11 to 15~~ claim 11, wherein the paste comprises any of the following additional ingredients either alone or in combination: water, at least one polar dispersing medium and at least one polymeric surfactant.
17. (original) A method according to claim 16, wherein the polymeric surfactant is selected from polymethacrylic acid (PMAA), poly-methacrylate (PMMA), polyvinyl alcohol and methyl cellulose.
18. (currently amended) A method according to claim 16 ~~or claim 17~~, wherein the polymeric surfactant constitutes upto about 5% w/w.
19. (currently amended) A method according to ~~any of claims 11 to 18~~ claim 11, wherein the coating afforded has a thermal conductivity below 1.0 w/m°C.
20. (currently amended) A method according to ~~any of claims 11 to 19~~ claim 11, wherein the coating afforded comprises stable zirconia phases.
21. (currently amended) A method according to ~~any of claims 11 to 20~~ claim 11, wherein the green coating is heated at any temperature in the range from 300 to 1200°C.
22. (currently amended) A method according to ~~any of claims 11 to 21~~ claim 11, wherein following heat treatment the ceramic coating is infiltrated with an infiltration suspension or slurry.
23. (original) A method according to claim 22, wherein the infiltration process takes place in a pressure chamber at a pressure greater than 1MPa.
24. (currently amended) A method according to claim 22 ~~or claim 23~~, wherein the infiltration suspension or slurry exclusively comprises nano-sized particles.

25. (currently amended) A method according to claim 22 ~~or claim 23~~, wherein the infiltration suspension or slurry comprises a mixture of nano-particles and conventional fine powders.
26. (currently amended) A method according to ~~any one of claims 11 to 25~~ claim 11 wherein the infiltration media is selected from any of the following either alone or in combination: molten metals, molten salts, metallic particles dispersed within a carrier medium, polymeric materials and inorganic binders.
27. (original) A green composite coating material comprising pre-formed particles dispersed within a solvent together with an infiltration media and/or nano-sized particles.
28. (original) A method for producing a composite coating upon a substrate comprising the steps of:
- preparing pre-formed particles,
 - preparing an infiltration medium,
 - mixing together said particles and said medium,
 - optionally adding to the mixture a nano-slurry or suspension,
 - applying the aforesaid mixture to the substrate, and
 - heat treating the system such that the aforesaid particles become sintered/set thus producing a composite coating.
29. (original) A method of infiltrating a composite coating comprising the steps of:
- preparing a substrate having a composite coating as referred to in claim 2,
 - applying to the said coating an infiltration medium and/or nano-suspension/slurry, and
 - heat treating the aforesaid infiltrated coating.
30. (currently amended) A method according to ~~any of claims 22 to 29~~ claim 22, wherein the infiltration media has a solid loading in the range from 5 to 80wt%.

31. (currently amended) A method according to ~~any one of claims 22 to 30~~ claim 22, wherein following infiltration the coating is dried and heat treated at a temperature in the range from 300 to 1200°C.

32. (currently amended) ~~According to a further aspect of the present invention there is provided a~~ A method for producing a ceramic/metal composite coating upon a substrate comprising the steps of:

- preparing pre-formed particles,
- preparing a nano-slurry,
- mixing together said particles and said slurry,
- applying the aforesaid mixture to the substrate, ~~and~~
- heat treating the system to produce a partially sintered ceramic porous coating; and
- filling the pores and voids in aforesaid ceramic porous coating by employing electrochemical plating and/or electroless deposition with metallic materials, thus forming a ceramic/metal composite coating.

33. (original) A method according to claim 32, wherein the metallic materials are selected from any of the following either alone or in combination: a pure metal such as iron, cobalt, nickel, molybdenum, tungsten, lanthanum, uttrium, vanadium, mobium, tantalum, chromium, boron, aluminium, silicone, titanium, zirconium, hafnium or an alloy thereof.